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THE MULTIPLE VALUES OF NATURE

Research Article



The value of listening and listening for values in conservation

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Abstract

1. Listening is a pervasive and significant act of conservation research and praxis, mattering greatly for the realisation of conservation agendas, not least its ambitions to be outward looking and inclusive in approach. Yet, the value and role of listening has been barely explored in a sustained and reflexive way.
2. This paper is a preliminary schematic of what it might mean to attend to the act of listening, set within the context of a larger field of listening scholarship as well as more specific manoeuvres to embed relational approaches into the study of people and nature interactions.
3. We explore what it means to 'listen well' within the context of conservation, highlighting the importance of recognising listening as a relationship and our positions and power within those relationships; the need to care for the relationship through respect and empathy; and the building of inclusive relationships of listening by attending to how space and time influences understanding.
4. We offer examples of how researchers and practitioners can create spaces for listening, illustrating our discussion with personal reflections about listening practices gained through our various conservation and research careers.
5. We provide approaches and ideas which help the reader—academic and practitioner—to both understand and articulate the value of listening in conservation and relational values of nature. We hope to inspire the wider use of listening-based approaches in conservation research and practice, and the recognition and support from senior managers and funders of what is needed to promote long-term and meaningful relationships between people and nature.

KEYWORDS

listening, conservation, relational values, relationships, conservation research

1 | LISTENING AS RELATIONAL

AB: "Interviewing villagers in Nepal about the impacts of climate change, I heard many stories about failed

crops, hardships, and risks to lives and livelihoods. However, the story of one old man stood out: He talked of the sadness he felt at no longer hearing the song of the birds that used to be in the village."

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Biodiversity conservation and practices that protect nature are underpinned by relationships—relationships between different groups of people (e.g. conservation groups and farmers), within groups of people (e.g. farmers) and between people and nature (e.g. people and farm animals or forests). These relationships can build understanding, appreciation, friendship, trust, reciprocity, responsibility and ultimately, care (Enqvist et al., 2018; Neuteleers, 2020; West et al., 2018). Importantly, generating and cultivating these affirmative relationships depends on acts of listening. The sadness of the old man in Nepal, over the loss of birdsong, reminds us of the importance of listening to both human and more-than-human voices. By listening to the old man's story, we learn that the suite of values impacted by climate change goes beyond livelihoods. At the same time, the value of the birds for the old man is embodied by his act of listening.

While formal and time-bound processes of stakeholder engagement and stakeholder dialogue receive much attention in conservation science (e.g. Gregory et al., 2012; O'Faircheallaigh, 2010; Owens, 2016), the value of the 'simple' act of listening, including as an everyday 'informal' and ongoing practice, does not typically receive the same attention. This paper articulates, explores and accounts for the value and role of listening in conservation research and praxis; what it does, why it is necessary, how it builds over time, and the spaces and contexts which enable 'deep' listening, leading to reciprocal conversations and meaningful relationships. To that end, we articulate both the value of listening—that is, why it is important for conservation—as well as the need to listen for values—that is, the role of listening to understand human–nature relationships and values.

Matters of relating and relationality have been increasingly elaborated as part of research emphasising the entangled and interconnected nature not just of humans, but of all things (see e.g. Betts et al., 2015; Massey, 2005; Tsing et al. 2017). In the context of conservation, the importance of relational aspects has come to the fore in connection to debates around values. Traditionally, these debates centred on the question of whether intrinsic or instrumental values (such as those exemplified in ecosystem services frameworks) are effective at promoting conservation (e.g. Kareiva et al., 2007; Soulé, 2013). Relational values can help overcome the seeming impasse between these different values (Chan et al. 2016; Tallis & Lubchenco, 2014). Whereas instrumental values of nature focus on benefits to people and intrinsic values on nature for its own sake, relational values are those values 'associated with relationships' both 'between people and nature', as well as 'relationships that are between people but involve nature' (Chan et al., 2016, p. 1462). Relational values can be seen as 'bi-directional' in that they recognise reciprocity and care in human–nature interactions, and emphasise that humans are not mere receivers of benefits from nature, but also care for and steward nature (Deplazes-Zemp & Chapman, 2020). In this paper, we elaborate the premise that relating involves forms of listening, and listening is a form of relating.

We propose several key roles that listening can play in the emerging literature and practice around relational values. First, many research methods used to elicit relational values involve

different forms of listening (e.g. interviews, ethnographic methods, focus groups). Second, practitioners involved in nature conservation employ listening as a tool both to understand the groups they work with and to facilitate mutual understanding between stakeholders. Incorporation not only of stakeholder interests but also values, and in particular relational values, can improve conservation practice—and is facilitated by the use of listening (e.g. Chapman et al., 2019). Third, we propose that listening in various forms is an essential component of relational values—both those between humans mediated by nature and those between humans and nature directly. Finally, the concept of relational values itself can listen to and learn from diverse literatures addressing relationality. We highlight several of these literatures in this paper and the conceptual and methodological contributions they can make to the literature on relational values, focusing around the idea of listening.

In this paper, we present how listening has emerged as a field of research within different disciplines. We then explore what it means to 'listen well' within the context of conservation, highlighting the importance of recognising listening as a relationship and our positions within those relationships, the need to care for the relationship through respect and empathy, and the building of inclusive relationships of listening by attending to how space and time influences understanding. We offer examples of how researchers and practitioners can create spaces for listening, illustrating our discussion with short personal reflections about listening practices gained through our various conservation and research careers. This is intended both to articulate how we have practiced listening during our work, and as a practical example of listening to our own personal experiences as part of our collaborative writing process. Our primary explanatory focus is on physical and immediate spaces of listening, but this orientation should not be taken to mean that other venues for listening—not least those created and mediated through technology and at a distance—are not important. We see listening as a process of active co-presence, and thus our focus on the physical, embodied act of listening is a pragmatic, rather than normative, orientation.

Overall, the goal of our paper is to provide approaches and ideas which help the reader—academic and practitioner—to both understand and articulate the value of listening in conservation and relational values of nature. We hope to inspire the wider use of listening-based approaches in conservation research and practice, and the recognition and support from senior managers and funders of what is needed to promote long-term and meaningful relationships between people and nature. In-so-doing we respond to Gould's call¹ for conservation to be more inclusive and imaginative, and draw attention to—and inspiration from—those already working in this way, whose supposedly 'simple' daily acts of listening often go unrecognised. Our paper also responds to current calls for conservation to move beyond 'the usual suspects' and to consider equality and diversity, by discussing *who* and *what* should be listened to, and *by whom*, when considering multiple values of nature. This can include human individuals and groups who are usually not included in the conversations as well as non-human others who are often seen

as lacking a (relevant) voice or whose 'voice' is only represented in the form of expert knowledge.

2 | WHAT DOES IT MEAN TO LISTEN?

Listening is a multidisciplinary and diffusely emerging field of study. Although no unified theory or approach to listening exists, major directions of listening scholarship reflect the sustained influence of psychology, linguistics and communication studies. These preoccupations have in turn shaped the focus of networks of professional affiliation formally assembling around the idea of listening, not least the International Listening Association (www.listen.org/).

According to Bodie et al. (2008), formative academic research constructed the act of listening as primarily a processing activity, one concerned with the retention of information presented orally and thus a matter of measuring comprehension in an essentially linear act of 'sender/receiver' communication. This processing view of listening can be contrasted with the study of listening as a set of behaviours governing the achievement of individual goals in communication; the so-called listening competency perspective. A competency perspective focuses on the character of listening skills that people need to function effectively within a communicative act, such as distinguishing between facts and opinion. These processing and competency perspectives sit alongside a body of work emphasising listening as a set of styles, habits and preferences on the part of individuals in communication. From this vantage point, concern shifts to understanding the way people are predisposed to particular ways of listening, and accounting for these through the study of cognitive processes, the elaboration of personality traits, as well as how listening styles may vary and be adapted to particular situations.

Although diverse, these strands of listening scholarship have, in the main, given rise to highly formalised schematics of the act of listening, often presented as a series of stages (e.g. receiving, understanding, evaluating and responding) from which model listening practices (e.g. good, effective, successful) has been advanced across a variety of fields of practice, not least by improving individual listening 'techniques'. Indeed, an epistemic community of researchers and practitioners has emerged attending to issues of listening in a variety of civil society and economic contexts, from improving pedagogical practice in the classroom (Wolvin, 2012), enhancing patient communication in health care settings (van Dulmen, 2017) and customer relations in service industries (Brownell, 1994), through to relationship building in non-profit fundraising (Drollinger, 2018) and the sales encounter (Comer & Drollinger, 1999; Itani et al., 2019).

In the present context of values which we address in this paper, it is notable that, while often formalistic in tone, listening scholarship has regularly attended to the relational and humanising dimensions of efforts to listen. Listening can be construed as a normative act in its own right (e.g. vis. 'hearing', or 'speaking'); or distinguished into listening archetypes from which normative listening behaviour can be inferred, such as 'deep' and 'active' listening (i.e. vis.

'shallow' and 'passive'). Listening from this vantage point accrues significance from the larger set of relational principles and virtues transpiring in communication, among these cultivating respect and empathy, suppressing judgement and giving voice/agency to others. These relational concerns are themselves longstanding in wider venues and contexts for social research, and increasingly extend the hinterland of the emerging field of listening scholarship. We are, for instance, witnessing the gentle re-calibration of prevailing approaches to social field research—not least ethnography, interviews, participant observation—through recognition and attention to the dynamics of listening, both as a hidden dimension of existing practice (Bennett et al., 2015; Forsey, 2010; Ratham, 2019) and a new methodological tack and mind set within field work (Koch, 2020).

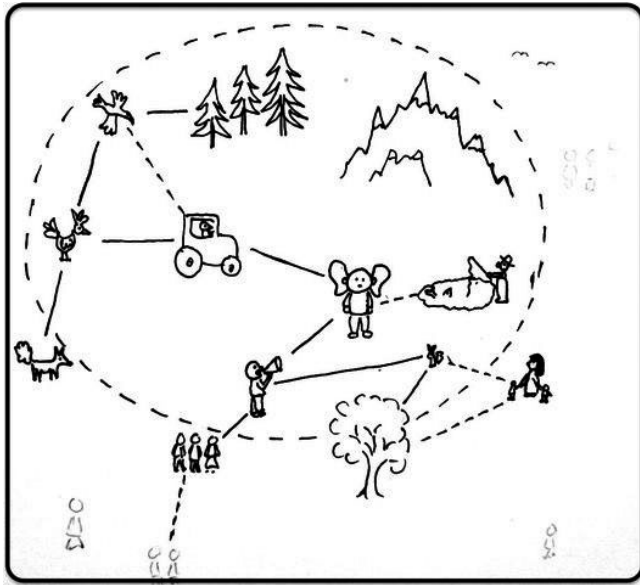
3 | FRAMING RELATIONSHIPS OF LISTENING IN CONSERVATION

Across conservation, environment and sustainability practice, listening is key. We frequently hear calls to 'listen', for example, to landowners to improve private land conservation programs (Fischer, 2004; Millar, 2001; Sketch et al., 2020), or to potential PES² participants when designing programmes (Petheram & Campbell, 2010), whose views of the purpose and meaning of such programmes may differ from those of programme managers (Chapman, Satterfield, Wittman, et al., 2020). Finding ways to appropriately listen is also central to formalised 'listening' processes, such as government mandates for consultation with First Nations (Gregory et al., 2008) and other consultative and participatory approaches.

To be effective, conservation must attend to the relational values enacted between people and nature—and those relations between people and nature emerge, in part, through the relational act of listening. Building from the broad scholarship on listening, introduced above, we offer here a conceptual framework with which to understand these relationships of listening in and for conservation. Our framework highlights three interconnected features; first, the importance of recognising listening as a relationship and the positions and power of those within that relationship; second, caring for that relationship, through empathy and attentiveness; and third, building inclusive relationships, by listening deeply and to giving voice to others. We also include examples of how these features are part of practicing listening well in conservation, both as practitioners and researchers, and in relation to the non-human. Relationships of listening in conservation, and the features we describe here, are conveyed in Figure 1.

3.1 | Recognising the relationship

Recognising that listening is a relational act necessarily directs attention to the actors involved in that relationship, be they human or more-than-human. Understanding practices of listening thus entails



understanding the listeners involved, and the positions, perspectives, power and values they bring with them to relationships of listening. Whilst some listeners may attempt to suppress their own selves to encourage the speaker to speak, thereby cultivating an 'ear from nowhere' (Berman, 2020), others emphasise that the relationality of listening (Bennett et al., 2015) demands that listening is always performed from 'somewhere'. Understanding the positionality of the listener becomes important as it may affect their ability and attitude in relationships of listening. Positionality here refers to the listeners' relationships to others based on their intersectional identity, emerging from, for example, their gender, age, race, organisational affiliation, family history, interest group membership etc. Identity, and hence positionality, is not however fixed, rather it emerges out of relationships with other people, places and processes; as such they are dynamic and ever 'in-the-making' (Sundberg, 2004). Relationships of listening in conservation, through on-going respect and reciprocity, can lead to trust and even friendship for example (Staddon, in press), thus the positionality of the listener shifts to one where the speaker may share more of their feelings, providing the listener with greater understanding and appreciation of others.

across forms of difference, for example, in understanding those from rival interest groups or those from other parts of the world. Extra care, time and effort may be needed to understand the values, ontologies and epistemologies of those from different communities, be they place-based, interest-based or identity-based. Indeed, one way to increase inclusivity in conservation is by listening to historical narratives of injustice (Gould et al., 2018).

In summary, recognising listening as a relational act means paying attention to the relationships of difference and of power embedded in conservation practice and research. This is imperative as it offers us a way to understand how we might cultivate empathy with those we listen to (Section 3.2), and how we might build inclusive relationships and engage with marginalised actors and give voice to their concerns in conservation (Section 3.3).

3.2 | Caring for the relationship

Meaningful relationships of listening must be conducted with an attitude of respect, empathy and care. Listening with respect leaves doorways open for continual exchange—giving people space to say what they are driven to express; listening with empathy can often reveal what is behind the words. Literature on care can help to understand what listening with respect and empathy entails in conservation. While research on care originally focused on humans, the concept of care has increasingly been used to look at how we as humans relate to the more-than-human (e.g. Van Dooren, 2014; Nassauer, 2011; Puig de la Bellacasa, 2017; Streit Krug, 2020). The literature on care emphasises the importance of attentiveness to be able not just to care, but to care well for the other (Sevenhuijsen, 2018). Attentiveness is required because there are often different perceptions and understandings of care needs and

priorities, as well as of what 'caring well' means. Caring well thus requires paying attention to the other and their needs, as well as to power differences amongst those giving, receiving and making decisions about care (Tronto, 1993).

The kind of attentiveness required to care well overlaps in many ways with what we describe as listening. Attentiveness can thus be understood as a practice, a value and an attitude (Sevenhuijsen, 2018; Tronto, 1993). Attentiveness means spending time, building a relationship, interacting and acknowledging differences. In the context of conservation, for example, we often find different understandings amongst farmers, the general public and conservationists about what it means to care for the land and biodiversity (e.g. Burgess et al., 2000; Chapman et al., 2019; Harrison et al., 1998). In relation to non-human others, attentiveness means paying attention to the reactions of animals, plants and ecosystems to what we do, both where they are the targets of interventions and where they are not.

The literature on care can also help to bring attention to relationality and reciprocity within conservation. Care literature thus highlights that care is not a one-way undertaking, but constitutes a reciprocal relationship. Receiving and giving care is a basic precondition for life and part of our relations with others which help define a meaningful life (Tronto, 1993). In many indigenous cultures the concept of caring relations as part of living well is explicitly applied to the more-than-human world as well as the human world with strong implications not only for well-being but also for conservation (Haggerty et al., 2018; McGregor, 2018).

West and colleagues suggest that relational values are 'reflective and expressive of care' and that care can be 'understood in its broadest sense as "looking after" something, infused with an attentive interest and concern for its wellbeing' (West et al., 2018, pp. 1–2). While not explicitly referring to listening in their discussion of care, West et al.'s description of care matches well with Ebenreck's 'of listening to the land' (Ebenreck, 1983)—both require attentiveness. Even within the human-to-human realm, listening often involves more than just auditory signals; rather, it is a broader sense of attentiveness. Deplazes-Zemp and Chapman (2020) describe relational values as involving a bi-directional relationship, in which a eudaimonic contribution to well-being is combined with genuine appreciation. It is hard to imagine a form of genuine appreciation that does not involve some kind of attentiveness.

In summary, listening may be considered a widespread component of relational values themselves. As with attentive care, we might also see listening as a practice, a value and an attitude (Sevenhuijsen, 2018); and as part of a 'politics of care' (Askins & Blazek, 2017). Relationships of care and reciprocity allow listening to be approached with an attitude conducive to learning and building inclusive relationships, to which we now turn.

3.3 | Building inclusive relationships

The act of listening to and then acting on behalf of others imbues the listener with power, as they can choose who they listen to, how they

listen and how they subsequently represent the speaker. As conservation practitioners and researchers, we reiterate it is important to stand back and reflect on our positionalities and how they may affect our choice of those to listen to and how we represent them in our work. We need to be open and to hear what others wish to say without judgement and without immediately suppressing opposition with our own points of view; a new idea, an old idea, a controversial approach, all need to be listened to. Cultivating an ethic and attitude of care and reciprocity makes listening across differences easier (Section 3.2), but it is also imperative to make the necessary time and space for listening deeply, and for the inclusion of missing or under-represented voices.

Conservation is increasingly called upon to engage with indigenous peoples around the world, and to engage with 'traditional' or 'indigenous' ecological knowledges (Horowitz, 2015; Wheeler et al., 2020). Given differences in identities, ontologies and epistemologies, this presents real challenges to conservation however, which go far beyond issues of language and translation. West describes what can happen when conservation efforts fail to listen, or to listen adequately, in such contexts (West, 2006). Women in Maimafu, a community in Papua New Guinea, traditionally make net string bags, called 'bilum,' which serve as important relational symbols as part of women's family and friendships. When a conservation and development project started selling bilum as a way to generate income, a cascade of changes followed: the bride price increased and with it, men's expectations for their wives' labour, and these additional demands on their labour meant they lost a measure of autonomy over the sharing and exchange of bilum. The commodification of bilum was started by two Peace Corps volunteers at the suggestion of some local women, and while in a sense it can be seen as listening to the local community, it shows that simply listening may not be enough. This example illustrates that in conservation practice, listening requires developing a deeper understanding of the current and historical social context prior to implementing a new project, and reminds us of the power of conservation to shift social relations, including, unintentionally, for the worse.

Scholarship on indigenous knowledge suggests that understanding (via listening) facilitates knowledge co-production and improves engagement with indigenous-led institutions (Sheremata, 2018). Both West and Sheremata's work highlight the need and challenge of listening when working across cultures and knowledge systems. Listening may require more than just offering an ear in these cases; instead it involves a long process of seeking to understand. For this reason, we describe listening as a practice and not an event—it must be ongoing. If we hope to weave together diverse knowledge systems for sustainability, then this kind of listening—this process and practice of seeking to understand across knowledge systems—must be included (Tengö et al., 2017).

A related type of listening to that of building understanding across knowledge systems, is listening to build relationships and resolve value conflicts. Value conflicts play a role in many environmental challenges (Martinez-Alier, 2008; Redpath et al., 2015; Trainor, 2006). Gould et al. (2019) describe the Hawaiian indigenous

practice of ho'oponopono as 'deep listening in a righteous, balanced, and open—that is, in a pono—way', and as a form of dispute resolution with relationships and listening at its centre. Listening then serves a relational function—and requires 'trust, sincerity, and honesty' (Chun, 2011, pp. 158–9 quoted in Gould et al., 2019). Such deliberative approaches that centre listening in the way of ho'oponopono or the West African concept of 'palaver' (Scheid, 2011) have much to offer in the way of addressing conservation challenges. Listening is already central to deliberative democracy (Ryfe, 2002) and some would argue to democracy itself (Dobson, 2012). Decolonial scholars and activists too draw attention to the need for listening to address past and present epistemic violence, pointing to the potential for dialogue based on 'ecologies of knowledge' (Santos de Sousa, 2008) and 'interculturality' (Walsh, 2005), as long as under conditions of equality, mutual legitimacy, equity and symmetry (Rodriguez, 2020). The process of identifying values, and not just interests and positions, is central to negotiation and decision-making processes, such as Structured Decision Making (Failing et al., 2012). Indeed, when values are not given space to be voiced and heard, decision-making and collaborative approaches can falter (Chapman, Satterfield, & Chan, 2020; Satterfield & Levin, 2007). These concepts remind us that the work of listening and even listening to values, must however be underpinned by a focus on relationships. The work of understanding diverse values requires a focus on relationships and trust, built over time (Gee et al., 2017).

Listening is a practice that cannot be done once and checked off—it is a relationship that needs to be built over time. The importance of trust in conservation is well acknowledged, and research in this area highlights how trust emerges over time; however, that is also dynamic and can be lost as well as gained (Coleman & Stern, 2018; Stern, 2017; Stern & Coleman, 2015; Young et al., 2016). Discussing the case of conservation in the Virgin Islands National Park, Stern and Baird (2015) reveal what leads to 'quality relationships' between park staff and local residents, finding that the spaces in which communication takes place are important, such as the park superintendent walking the local towns' streets to chat with residents, hosting social gatherings at home, and taking time to talk informally with local staff. Whilst much conservation takes place in formal and structured settings, such as workshops, offices or stakeholder meetings, those studying common-pool resource management argue that relationship-building and decision-making can be overlooked and is 'often invisible, being located in daily interactions of ordinary lives' (Cleaver, 2001, p. 381). Feminist political ecologists also call attention to the importance of spaces where relationships involving nature are built, arguing the relevance of so-called informal, everyday and personal spaces (Gururani, 2002; Mollett, 2018; Nightingale, 2011; Pickerill, 2009; Sultana, 2011). Exploring cooperation between Welsh farmers, Wynne-Jones (2017) provides an example of 'the kitchen table' as an important space where farmers are brought together, nurturing less formalised interactions and increasingly habitual expectations of openness, generosity and care. Discussing conservation in the Scottish Highlands, Staddon (in press) reveals the importance not only of conservationists spending time

with farmers in their fields, but also of the shared everyday spaces in which their relationships, and mutual understanding and respect are built, such as in the nearby pub or at the local school. One conservationist stated that 'conservation's all about having a blether and getting people on board'; a 'blether' being a colloquial Scottish term signifying a lengthy chat between friends, often with no particular focus or tangible outcome.

The idea of having a blether reminds us of the informal and the personal—rather than the formal and the public—and how relationships between conservationists and land managers are built through embodied and emotional acts of listening and learning. Indeed, these examples highlight the importance of informal spaces for listening even within more formal consultations and events: the value of conversations during a coffee break, or while sharing a train journey home from a workshop. The changing working environment due to the Covid pandemic has meant many of these informal trust-building and listening opportunities have been lost as interactions have moved online. As we emerge from the pandemic, we will need to reflect on the potential impact of the likely push for continued online events and interactions. Such online activities of course have many advantages (e.g. increased accessibility, reduced time and cost, and lower carbon impact of traveling to events), but also come at a cost of losing informal spaces for interaction.

As is the case amongst humans, listening to the more-than-human always takes place in a particular context which includes not only the methods, quality and intent of listening but also values, assumptions and power relations which influence whose voices are heard and included, how their messages are interpreted and what importance they are accorded. In the case of the more-than-human, questions of translation and representation are even more challenging. Whose knowledge of non-human others and their interests is regarded as legitimate and who is authorised to speak for the more-than-human? The default position for many years has been that only scientific knowledge counts as valid knowledge, and that, therefore, only scientists are regarded as legitimate advocates and spokespersons for the more-than-human (Cruikshank, 2001; Klenk, 2008). However, this position has been criticised on philosophical grounds and from approaches such as post-normal science, and science and technology studies. The legitimacy claims of science have often been based on claims to objectivity and value neutrality on the part of science, and of standing outside of the system, process or phenomenon being studied. However, critics have argued that emotions, values and inter-relationships are an inherent part of generating knowledge regardless of whether this takes place in the context of scientific research (Ingold, 2006; Noss, 2007; Ravetz, 2004; Van Houtan, 2006; Wright et al., 2012).

In summary, whilst—superficially at least—listening may be considered a 'simple' and everyday task, it is clear that building meaningful and inclusive relationships of listening in conservation takes time, space and sustained effort. Demands for greater equality and diversity within conservation, and the inclusion of a wider set of voices—both human and the more-than-human—in the creation of conservation knowledge and practice, give primacy to the facets

of listening we highlight here. By reflecting on the positionality of listeners within conservation, by listening with care and attentiveness, and by considering time and space in conservation practices, meaningful relationships of listening and mutual understanding can be built. We next explore how this can work in a number of contexts, considering listening in conservation practice, listening to the more-than-human, and listening in conservation research.

4 | PRACTICING LISTENING IN CONSERVATION

4.1 | Listening in conservation practice

KH: “In a new woodland, created on a former colliery site, I couldn’t understand why one group of volunteers was so set on planting wildflowers in a rather hidden and obscure spot. I had stopped by a group member’s house to chat about a different issue with the site but the wildflowers came up over a cup of tea. During the subsequent site visit with the group they showed me where they meant and explained that the flowers were part of a remembrance garden for the miners who were still buried beneath the hill of spoil that formed the site, and the ashes of former mine workers were often spread here. Their care for place was specific and deeply personal, and needed recognition and space to be heard.”

A practitioner’s day to day is probably one of diverse listening—to each other, to other humans and to the more than human, and all are embedded in a process of listening that goes beyond a time-restricted formalised activity. Listening is a continual flow and exchange of information to, superficially at least, ensure mutually agreed good care of place, where the practitioner becomes the repository of multiple strands of advice and information, both within and outside their organisation. This means practitioners can never be objective observers and doers of conservation—as well as having specific, personal motivations for their job choice, they are also positioned by their employer’s approach to conservation (Primmer et al., 2017). Site Rangers, Wardens, Community Officers for example, often become the human element of an organisation that is embedded in a space, interacting and exchanging information with the other humans who are also connected to it and to the non-human that we hope to look after. This means we need time to acknowledge our relationships with others to understand well the places where we work and the people who are connected to them, and while some of this comes from written records and our own observations, a great deal more is learned through listening to others. Over time, the relationships that are built through this flow of listening move beyond care of place and into care of each other—whether or not this is directly expressed. This is, however, a fundamental role of the practitioner—to build trust over time and through listening that enables good care to continue.

While listening is part of the everyday, it is rare in conservation practice for space and time to be dedicated to listening using methodological approaches comparable to those employed by researchers. However, some listening is formalised and recorded, for example, site meetings, steering groups, committee meetings and presentations. These structured settings are essential for agenda setting, planning actions, checking legalities and restrictions, informing partners and publics, and building formal networks and platforms for communications. This is the listening that is written down, ticked off, project planned and recorded, and often takes place in set locations and contexts, with boundaries and restrictions placed on what is heard and what is not. This is listening that recognises relationships in a very structured way and it can serve as a tool to reveal missing or disconnected relationships through gaps in information or questions that cannot be fully answered. Even when projects are able to use other methods (e.g. video feedback or stakeholder forums), these are invariably led by external facilitators and researchers rather than directly by practitioners themselves.

The daily listening of many practitioners is however largely informal, taking place during conservation work parties, at events, during site checks, as we enter offices and make coffee. It is often unfocused and free, giving voice to people who may never otherwise be asked, answering questions we were not aware of, and telling stories that we could not look for, as we had no idea they existed. This is having a cup of tea around someone’s kitchen table, wandering around a site on a sunny afternoon, stopping by the village shop on the off chance, checking in with a volunteer (‘having a blether’). It can happen within the working day but is just as likely, if we are local, to take place beyond it.

Good practice needs this informal attention to others, recognising and building relationships, demonstrating care and allowing time and space for other voices to speak. It sits alongside how we listen, daily, to the non-humans that are the reason why many practitioners work in conservation. Attentive, careful and open listening creates spaces for other voices and silence to fill in gaps in our relationships with place. This way of listening is seldom acknowledged, rarely recorded or given the time or space it requires to consciously inform decision making for place. Yet it unconsciously informs our understandings of and connections to others and the places where we work.

The importance of listening can be more formally acknowledged, raised with and acknowledged by senior managers by, for example, highlighting the role of listening and attentiveness in project case studies, by building time for relationship building into funded projects, and by making stories of place and place-making a key output. Rather than this taking time away from the practical outputs of conservation projects, attention to how we listen to one another and to place increases trust and understanding between practitioners and communities. In the long-term, this is more resource efficient: a connected, attentive practitioner has extra eyes checking on reserves and recording sightings, more people giving and receiving knowledge about their local spaces to help to care for them, knowledge about sensitivities, better information about opportunities for funding,

people willing to join NGOs as members, opportunities for community based projects, and opportunities to share skills that can be passed through communities. The time that committed practitioners invest in actively listening is easily repaid by the capacity building it engenders locally. For example, as work by Richardson has shown, taking time to evaluate how people connect with everyday nature through NGO run projects yields insights into the diverse ways in which people connect with and understand nature (Richardson & McKewan, 2018; Richardson et al., 2020). From a funding and resource viewpoint, this detailed attention to the diverse outputs and benefits of projects increases impact and value for communities and conservation NGOs. In some cases, where time and resources are limited, we recognise that it is not always possible to build relationships of trust with all individuals. However, demonstrating a willingness to create relationships of care across communities can nevertheless yield better project outcomes, especially if it is likely that there will be intermittent projects over time.

4.2 | Listening to the more-than-human in conservation

AB: "As part of a course on nature connections we were tasked to draw a sound map. Sitting under a tree, I became aware of the sound of the wind moving through the treetops. It was a soft, swooshing sound, coming closer, then receding, expanding then contracting. I struggled to find a way to draw this and ended up with broad, blurry waves. Slowly, the page filled with stars, triangles, squiggly lines, sharp arrows, amorphous clouds as I became aware of more sounds. Afterwards, we looked at everybody's maps. Each map was different, not only because our ears picked up different sounds, but also because we experienced different qualities in the sounds and translated them differently. The maps vividly showed our immersion in a more-than-human world and how we related to this world where wind swooshes through trees while cooling my cheeks, cars speed up and break, dogs bark and run, rain drops drip on my notebook, and birds alert each other to my presence with their chirping."

While we can intuitively relate to listening to other humans as part of our everyday relationships, listening to non-human others may challenge our concepts of listening. What does it mean to listen to animals, plants, rivers, clouds; why should we do it and how can this be done in a meaningful way? Studies show that listening to the more-than human is often a fundamental part of how indigenous people relate to the land and its many non-human inhabitants (Bawaka Country et al., 2016; Cruikshank, 2001; McGregor, 2018). While some of the listening is done with the ears, this kind of listening is often multi-sensorial, also including the visual, smells, vibrations and touch (Haskell, 2018; Ingold & Kurtilla, 2000). In addition, dreams, stories and songs may convey

knowledge of and from the more-than-human (Cruikshank, 2001; Ingold, 2013). These latter aspects have often meant that conservation professionals and researchers have found it difficult to include this kind of listening in conservation whether as direct practice or in the form of knowledge contributed by indigenous peoples (Klenk, 2008) instead relying on their own forms of listening to non-humans, for example, in the form of radio collars attached to animals.

Listening to non-human others is done for a variety of reasons: scientists listen to gather data about their research objects, while many indigenous peoples practice listening as part of relating to non-human others, who are regarded as members of the same community (e.g. Haggerty et al., 2018; Kimmerer, 2012; McGregor, 2018). This does not exclude that the listening also provides useful information, for example, to help a hunter locate their prey (e.g. Betts et al., 2017). However, even in these cases, the listening is not only a means to an end but also a way of relating, and of relational values. Ebenreck (1983) proposes a farmland ethic based around the idea of a partnership between people and nature, in which the relationship can involve a form of attention and care towards that land that might be considered a form of listening. She describes what listening could involve as, 'learning to "listen to the land," to know its needs as a basis for respecting its nature. That will involve walking the land, studying its soil, terrain, and water, knowing its native plants and history. Walking the land while asking one's self "what does it have to say to me?" may reveal essential knowledge related to the issue of what can appropriately be done with the land' (Ebenreck, 1983, p. 42). 'Walking the land' reminds us that listening takes place in particular spaces, and no doubt over time, enabling knowledge to be gained and learning to take place.

Trying to listen to non-human others is not without problems due to the radically different nature of our lived experiences and ways of being (Bawaka Country et al., 2020). However, while we may never fully know what it is like to be an owl, a fish or a tree, listening attentively may help us better understand the ways in which our lives are entangled through interactions and mutual impacts, and how we can live in the world together.

If we regard listening to non-human others as part of our ongoing relationship with them and as part of our being in the world, it would seem to follow that we should take seriously the idea that non-human others may also be listening to us. Partly this may seem a question of how we define 'listening'. Scientists have shown that plants react to vibrations, sunlight, pressure, gravity and chemicals, and some biologists regard the exchanges between, for example, plants and fungi as forms of conversation (Haskell, 2018; Kimmerer, 2012). On another level, though, this is also a question of how we understand the nature of the world and our own place in it. The notion of mutual listening between humans and non-humans is then linked to an understanding of a thoroughly relational world where everything is constantly in the process of coming into being in relationship with other humans as well as non-humans (Bawaka Country et al., 2016; Ingold, 2006). Listening in this sense is then awareness of and attention to a constant interaction and exchange with others, which shapes both us and them.

In many indigenous cultures this way of being in the world involves addressing non-human others in speech as well as through ritual formats. Scientists, too, can be said to address their research objects by presenting them with mazes, or through chemical or physical stimuli. While all of these can be seen as forms of initiating conversations, there are still marked differences. Animal experiments, for example, give the animal a very limited choice of response options (Despret, 2016), not unlike a questionnaire only allowing 'yes' or 'no' responses, often to the great frustration of respondents who feel that their ability to express themselves is being curtailed. It may therefore be helpful to look at the intent behind any type of conversation and listening. Are we issuing a command or asking a question and are we mainly driven by curiosity and a wish to relate or are we hoping to glean information that may enable us to better control the other? All of these will influence the form of the conversation and the types of responses that we may hope to receive whether we are addressing human or non-human others.

4.3 | Listening in conservation research

MC: "Mid-way through an interview with a private landowner in Washington State, I briefly summarized what I understood to be the key ideas my interviewee was explaining to me—a common listening practice. My interview partner stared back at me, a bit in shock—'wow, you were really listening to me.' It was a reminder to me how rare it can be to feel listened to and understood—and the space for this that an interview can create."

AH: "Participating in the life of a community over a period of time provides many opportunities for informal conversations. Yet I also felt a need for some semi-structured interviews for my data collection. In one case, I brought my voice recorder to ensure I was able to 'listen back' after our interview. I asked for permission to record the conversation and my participant agreed, but I sensed the voice recorder made them uncomfortable. I realised that I was using technology to listen for my own benefit, and that this was hindering our conversation. When I turned off the recorder at the end, my participant visibly relaxed and, as often happens, additional insights were forthcoming, putting the impetus to 'listen well' back on to me."

As conservation researchers seeking to understand and help improve conservation practices, listening is central to our work. We thus need to cultivate respect, suppress our own judgments and listen to other voices, as a core part of our research practice. Core themes in the practice of ethical research include respect for participants, ensuring we have consent to listen to others (UKRI, 2020), and listening to what participants wish to gain from taking part in

research and how they wish to see its results shared. Many people in conservation and conservation research, including the authors, have received formal training in social research methods, and the role of social science in conservation has been well-argued (e.g. Moon & Blackman, 2014; Sandbrook et al., 2013). Listening is central to social research methods aimed at eliciting relational values. These include qualitative methods such as interviews (Chapman et al., 2019) and focus groups (e.g. Nyumba et al., 2018), as well as methods such as surveys (Klain et al., 2017) that aim to 'listen' to a broader sample of participants than qualitative work would allow. Relational values have also been studied by 'listening' to texts describing knowledge systems and values of particular groups (Gould et al., 2019; Sheremata, 2018), and methods which analyse social media data, such as 'listening' to tweets via Natural Language Processing (Ballestar et al., 2020).

The practice of undertaking social research is fundamentally about listening well. In taking time to craft questions, people tell their stories and share their knowledge, and listening to the answers given means the interviewer can shape subsequent questions in a way that deepens the level of conversation. Being an 'active listener' in an interview enables us to 'listen to what is being said in order to assess how it relates to the research focus' (Hammersley & Atkinson, 1995, p.153). Insights can be gleaned from 'overheard talk' in participant observation (Emerson et al., 2011, p.5). The act of recording an interview can create space for a researcher to listen more intently, rather than focus on trying to remember what an interviewee is saying, while a good focus group leader gives space for different voices and viewpoints to be heard, even when they might speak over each other. As we hear above, however, the use of technologies to aid listening (or rather to aid the research process) can inhibit the flow of conversations, as can the language in which they are conducted. The language in which listening and conversations take place is particularly important in cross-cultural research, whether somewhere far around the world or closer to home, where dialects and accents may be equally significant. This connects to earlier discussions on positionality and power, which is relevant for researchers as well as their partners, assistants and translators (Twyman et al., 1999).

One of the fundamental tasks of the social researcher is to listen; it is central to most research methods. For example, in the most fundamental of qualitative research tools, interviewing, training should include not only how to lead interviews by asking good questions, the challenges and practicalities of setting up and running interviews, and the need for good quality recordings of those interviews, but equal attention is needed for learning how to listen. Good interviewing requires leaving space for a respondent to answer—and in doing so, ensure we also have time to listen more closely to what is being said. It is typical to make notes during an interview, follow those notes up with more extensive field notes and a precis of the key points immediately after the interview, and then turn attention to transcribing interview recordings and reading the transcripts. If researchers wait to 'listen' until they focus on interpreting the content of an interview

via studying the transcript to 'listen' for what was said, some of the nuances may be lost, along with the opportunity to ask further questions. Another common research technique—focus groups—are about facilitating conversations between groups of people around a specific topic. Facilitating a focus group requires 'good and active listening skills' (Nyumba et al., 2018), as well as more common advice seen in textbooks, such as the practicalities (how many participants? how many focus groups?) and the importance of recording and transcription (Bryman, 2012). In ethnography too, listening is central. Ethnographic methods include participant observation, in which the researcher is immersed in a research setting. Many key elements of ethnographic work require listening well, such as gaining access, observation, as well as participating intensely in a social situation, recording field notes (Emerson et al., 2011), making mental notes of what is observed to record after an event. Yet, relationships are of course central to ethnographic research methods and relationships are grounded in making space for listening to others and in building trusting relationships with them (Bryant, 2014).

These relationships extend as well to those between researchers of different disciplines. As conservation research becomes more inclusive of social sciences and humanities (Sandbrook et al., 2013; Teel et al., 2018) the need to listen well across disciplines (and even knowledge systems) too grows. At the foundation of approaches to integrate different types of knowledge (Tengö et al., 2014) is the need for listening. Working in a deeply interdisciplinary (or even 'undisciplinary') way requires epistemological agility, or an 'understanding of different ontological and epistemological standpoints and views across multiple disciplines' (Haider et al., 2017, p. 197). Building this understanding requires relationships of listening between researchers of different disciplines.

As researchers we can also use our ear to help conservation practitioners. We can listen to understand the context and needs of practitioners and use this to inform and or even co-create our research questions and design. We can function as an outside listener, to listen to and share challenges that respondents want to share anonymously (e.g. criticism, or difficult topics respondents might not want to share directly with practitioners but still want them to know). We can also create spaces and time for listening. Many practitioners must do much with little and do not always have the time to spend an hour or more drinking coffee and listening to 20 or 30 people impacted by their work—but as researchers this is part of our job. As researchers we can 'extend the ears' of and 'give voice' to practitioners, and for many researchers this is part of their ethical obligations to 'give back' to those involved in research (Staddon, 2014). Participatory research and creative methodologies are numerous and include listening and engaging through the medium of stories (Spiegel et al., 2020), songs (Scazza, no date) and maps (Hohenthal et al., 2017). Such imaginative approaches are increasingly called for (Gould, 2020³), however at times a simple conversation with practitioners will however suffice, allowing them to speak and be listened to, and to provide the necessary time away from daily tasks in order to stop and reflect on wider questions and challenges in conservation.

5 | CONCLUSION

Listening is a pervasive and significant act of conservation research and praxis, mattering greatly for the realisation of conservation agendas, not least its ambitions to be outward looking and inclusive in approach. Yet, the value and role of listening has been barely explored in a sustained and reflexive way. Listening is understood to matter intuitively, but little is understood about how listening is enabled and enacted in venues and contexts for conservation, and with what effect. This paper is a preliminary schematic of what it might mean to attend to the act of listening, set within the context of a larger field of listening scholarship as well as more specific manoeuvres to embed relational approaches into the study of people and nature interactions.

As we have demonstrated, when listening is understood through the prism of relational thinking, we are encouraged, if not mandated, to attend more carefully and substantively to the many and diverse ways listening manifests itself in conservation practice. Relational approaches are important in the way they orientate and attune us to particularity, uniqueness and specificity in our interactions between people and nature. Listening is one of the significant means by which these relational values for nature are cultivated and fostered. As a component of the emergent architecture of relational thinking in conservation, the act of listening is both a deeply humanising facet of conservation research and practice and a means by which human interactions with nature are themselves invested with meaning. Thus, our overall argument is that values for nature are decisively folded into the act of listening, and that we must give due consideration to the nature of our listening practices if we are to build an inclusive conservation. As such, we invite our readers, from your various positions—as conservation practitioners, researchers or somewhere between or beyond—to consider the myriad ways that listening matters, and how an ethics of listening might be promoted, in your work. To this end, we offer a set of questions to aid such reflection:

1. Who are you listening to, and who is not being listened to?
2. How does who you are shape what you hear and understand?
3. What language (including science, art, voice recorder etc.) is listening happening in?
4. What spaces are used for listening and how might this shape the kinds of conversations?
5. How long do you need to continue listening for?
6. How is care and attentiveness built through your listening practices?
7. Do you have consent to listen?
8. What are you going to do with what you hear? Who will you share stories with, and who will you try to 'give voice' to?
9. Are you listened to by colleagues, managers, funders etc.?
10. Are you cultivating an ethic of listening and opportunities for deep listening within your organisation or research team?
11. What conversations are happening that you are not hearing?
12. Should you invite others to listen with you - or on your behalf?

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Robert Fish is a Lead Editor and Mollie Chapman is an Associate Editor for *People and Nature*, but were not involved in the peer review and decision making process of this paper.

AUTHORS' CONTRIBUTIONS

S.S. conceived the initial idea; all authors then equally contributed to designing and writing the manuscript, including sharing their own experiences with listening. All authors contributed to reviewing the draft manuscript and gave approval for submission. S.S. is thus first author, and all others are listed alphabetically.

DATA AVAILABILITY STATEMENT

This paper is not associated with any data.

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ENDNOTES

¹ At the Multiple Values of Nature symposium, Bristol, UK, 2–3 March 2020.

² PES refers to Payments for Ecosystem Services schemes.

³ At the Multiple Values of Nature symposium, Bristol, UK, 2–3 March 2020.

REFERENCES

- Askins, K., & Blazek, M. (2017). Feeling our way: Academia, emotions and a politics of care. *Social & Cultural Geography*, 18, 1086–1105. <https://doi.org/10.1080/14649365.2016.1240224>
- Ballestar, M. T., Cuervo-Mir, M., & Freire-Rubio, M. T. (2020). The concept of sustainability on social media: A social listening approach. *Sustainability*, 12(5), 2122–2219. <https://doi.org/10.3390/su12052122>
- Bawaka Country, Wright, S., Suchet-Pearson, S., Lloyd, K., Burarrwanga, L., Ganambarr, R., Ganambarr-Stubbs, M., Ganambarr, B., Maymuru, D., & Sweeney, J. (2016). Co-becoming Bawaka: Towards a relational understanding of place/space. *Progress in Human Geography*, 40(4), 455–475. <https://doi.org/10.1177/0309132515589437>
- Bawaka Country, Wright, S., Suchet-Pearson, S., Lloyd, K., Burarrwanga, L., Ganambarr, R., Ganambarr-Stubbs, M., Ganambarr, B., & Maymuru, D. (2020). Gathering of the Clouds: Attending to Indigenous understandings of time and climate through songspirals. *Geoforum*, 108, 295–304. <https://doi.org/10.1016/j.geoforum.2019.05.017>
- Bennett, K., Cochrane, A., Mohan, G., & Neal, S. (2015). Listening. *Emotion, Space & Society*, 17, 7–14. <https://doi.org/10.1016/j.emospa.2015.10.002>
- Bennett, N. J., Roth, R., Klain, S. C., Chan, K., Christie, P., Clark, D. A., Cullman, G., Curran, D., Durbini, T. J., Epstein, G., Greenberg, A., Nelson, M. P., Sandlos, J., Stedman, R., Teel, T. L., Thomas, R., Verissimo, D., & Wyborn, C. (2017). Conservation social science: Understanding and integrating human dimensions to improve conservation. *Biological Conservation*, 205, 93–108.
- Berman, M. (2020). The ear from nowhere: Listening techniques and the politics of negation in the practice of Japanese interfaith chaplains. *Language & Communication*, 71, 72–82. <https://doi.org/10.1016/j.langcom.2020.01.002>
- Betts, M. W., Hardenberg, M., & Stirling, I. (2015). How animals create human history: Relational ecology and the Dorset-polar bear connection. *American Antiquity*, 80(1), 89–112. <https://doi.org/10.7183/0002-7316.79.4.89>
- Betts, M. W., Hardenberg, M., & Stirling, I. (2017). How animals create human history: Relational ecology and the Dorset-polar bear connection. *American Antiquity*, 80(1), 89–112. <https://doi.org/10.7183/0002-7316.79.4.89>
- Bodie, G. D., Worthington, D., Imhof, M., & Cooper, L. O. (2008). What would a unified field of listening look like? A proposal linking past perspectives and future endeavors. *The International Journal of Listening*, 22(2), 103–122. <https://doi.org/10.1080/10904010802174867>
- Brownell, J. (1994). Relational listening: Fostering effective communication practices in diverse organizational environments. *Hospitality & Tourism Educator*, 6(4), 11–16. <https://doi.org/10.1080/23298758.1994.10685609>
- Bryant, M. (2014). Fellow traveller or viper in the nest? Negotiating ethics in ethnographic research. In J. Lunn (Ed.), *Ethical challenges and dilemmas of fieldwork in the Global South* (pp.133–144). Routledge.
- Bryman, A. (2012). *Social research methods* (4th ed.). Oxford University Press.
- Burgess, J., Clark, J., & Harrison, C. M. (2000). Knowledges in action: An actor network analysis of a wetland agri-environment scheme. *Ecological Economics*, 35(1), 119–132. [https://doi.org/10.1016/S0921-8009\(00\)00172-5](https://doi.org/10.1016/S0921-8009(00)00172-5)
- Chan, K. M. A., Balvanera, P., Benessaiah, K., Chapman, M., Díaz, S., Gómez-Baggethun, E., Gould, R., Hannahs, N., Jax, K., Klain, S., Luck, G. W., Martín-López, B., Muraca, B., Norton, B., Ott, K., Pascual, U., Satterfield, T., Tadaki, M., Taggart, J., & Turner, N. (2016). Opinion: Why protect nature? Rethinking values and the environment. *Proceedings of the National Academy of Sciences of the United States of America*, 113, 1462–1465. <https://doi.org/10.1073/pnas.1525002113>
- Chapman, M., Satterfield, T., & Chan, K. M. A. (2019). When value conflicts are barriers: Can relational values help explain farmer participation in conservation incentive programs? *Land Use Policy*, 82, 464–475. <https://doi.org/10.1016/j.landusepol.2018.11.017>
- Chapman, M., Satterfield, T., & Chan, K. M. A. (2020). How value conflicts infected the science of riparian restoration for endangered salmon habitat in America's Pacific Northwest: Lessons for the application of conservation science to policy. *Biological Conservation*, 244, 108508. <https://doi.org/10.1016/j.biocon.2020.108508>
- Chapman, M., Satterfield, T., Wittman, H., & Chan, K. M. A. (2020). A payment by any other name: Is Costa Rica's PES a payment for

- services or a support for stewards? *World Development*, 129, 104900. <https://doi.org/10.1016/j.worlddev.2020.104900>
- Chun, M. N. (2011). *No Na Mamo: Traditional and contemporary hawaiian beliefs and practices*. University of Hawai'i Press.
- Cleaver, F. (2001). Institutions, agency and the limitations of participatory approaches to development. In B. Cooke & U. Kothari (Eds.), *Participation: The New Tyranny?* (pp. 36–55). Zed Books.
- Coleman, K., & Stern, M. J. (2018). Exploring the functions of different forms of trust in collaborative natural resource management. *Society & Natural Resources*, 31(1), 21–23. <https://doi.org/10.1080/08941920.2017.1364452>
- Comer, L. B., & Drollinger, T. (1999). Active empathetic listening and selling success: A conceptual framework. *Journal of Personal Selling & Sales Management*, 19(1), 15–29.
- Cruikshank, J. (2001). Glaciers and Climate Change: Perspectives from Oral Tradition. *Arctic*, 54(4), 377–393. <https://doi.org/10.14430/arctic795>
- Deplazes-Zemp, A., & Chapman, M. (2020). The ABCs of relational values: Environmental values that include aspects of both intrinsic and instrumental valuing. *Environmental Values*, 1–26. <https://doi.org/10.3197/096327120X15973379803726>
- Despret, V. (2016). *What would animals say if we asked the right questions?*. University of Minnesota Press.
- Dobson, A. (2012). Listening: The new democratic deficit. *Political Studies*, 60(4), 843–859. <https://doi.org/10.1111/j.1467-9248.2012.00944.x>
- Dominguez, L., & Luoma, C. (2020). Decolonising conservation policy: how colonial land and conservation ideologies persist and perpetuate indigenous injustices at the expense of the environment. *Land*, 9(3), 65. <https://doi.org/10.3390/land9030065>
- Drollinger, T. (2018). Using active empathetic listening to build relationships with major-gift donors. *Journal of Nonprofit & Public Sector Marketing*, 30(1), 37–51. <https://doi.org/10.1080/10495142.2017.1326336>
- Ebenreck, S. (1983). A partnership farmland ethic. *Environmental Ethics*, 5(1), 33–45. <https://doi.org/10.5840/enviroethics19835139>
- Emerson, R. M., Fretz, R. I., & Shaw, L. L. (2011). *Writing ethnographic fieldnotes* (2nd ed.). University of Chicago Press.
- Enqvist, J. P., West, S., Masterson, V. A., Haider, L. J., Svedin, U., & Tengö, M. (2018). Stewardship as a boundary object for sustainability research: Linking care, knowledge and agency. *Landscape and Urban Planning*, 179, 17–37. <https://doi.org/10.1016/j.landurbplan.2018.07.005>
- Evely, A. C., Fazey, I., Pinard, M., & Lambin, X. (2008). The influence of philosophical perspectives in integrative research: A conservation case study in the Cairngorms National Park. *Ecology and Society*, 13(2), 52.
- Failing, L., Gregory, R. S., & Higgins, P. (2012). Science, uncertainty, and values in ecological restoration: A case study in structured decision-making and adaptive management. *Restoration Ecology*, 21(4), 422–430. <https://doi.org/10.1111/j.1526-100X.2012.00919.x>
- Fischer, P. (2004). *Listening to landowners: Conservation case studies from Oregon's Willamette Valley*. Defenders of Wildlife. Retrieved from https://defenders.org/sites/default/files/publications/listening_to_landowners.pdf
- Forsey, M. (2010). Ethnography as participant listening. *Ethnography*, 11, 558–572.
- Garland, E. (2008). The elephant in the room: Confronting the colonial character of wildlife conservation in Africa. *African Studies Review*, 51, 51–74. <https://doi.org/10.1353/arw.0.0095>
- Gee, K., Kannan, A., Adlam, R., Brooks, C., Chapman, M., Cormier, R., Fischer, C., Fletcher, S., Gubbins, M., Shucksmith, R., & Shellock, R. (2017). Identifying culturally significant areas for marine spatial planning. *Ocean & Coastal Management*, 136, 139–147. <https://doi.org/10.1016/j.ocecoaman.2016.11.026>
- Gould, R. K., Pai, M., Muraca, B., & Chan, K. M. A. (2019). He 'ike 'ana ia i ka pono (it is a recognizing of the right thing): How one indigenous worldview informs relational values and social values. *Sustainability Science*, 14(5), 1213–1232. <https://doi.org/10.1007/s11625-019-00721-9>
- Gould, R. K., Phukan, I., Mendoza, M. E., Ardoin, N. M., & Panikkar, B. (2018). Seizing opportunities to diversify conservation. *Conservation Letters*, 11(4), e12431. <https://doi.org/10.1111/conl.12431>
- Green, S. J., Armstrong, J., Bogan, M., Darling, E., Kross, S., Rochman, C. M., Smyth, A., & Verissimo, D. (2015). Conservation needs diverse values, approaches and practitioners. *Conservation Letters*, 8(6), 385–387. <https://doi.org/10.1111/conl.12204>
- Gregory, R. S., Failing, L., & Harstone, M. (2008). Meaningful resource consultations with first peoples: Notes from British Columbia. *Environment: Science and Policy for Sustainable Development*, 50(1), 34–45.
- Gregory, R. S., Failing, L., Harstone, M., Long, G., & McDaniels, T. (2012). *Structured decision making: A practical guide to environmental management choices*. John Wiley & Sons.
- Gururani, S. (2002). Forests of Pleasure and Pain. Gendered practices of labor and livelihood in the forests of Kumaon Himalayas, India. *Gender, Place and Culture*, 9(3), 229–243.
- Haenn, N. (2016). The middle-class conservationist. Social dramas, blurred identity boundaries, and their environmental consequences in Mexican Conservation. *Current Anthropology*, 57(2), 197–218.
- Haggerty, J., Rink, E., McAnally, R., & Bird, E. (2018). Restoration and the affective ecologies of healing: Buffalo and the fort peck tribes. *Conservation and Society*, 16(1), 21–29. https://doi.org/10.4103/cs.cs_16_90
- Haider, L. J., Hentati-Sundberg, J., Giusti, M., Goodness, J., Hamann, M., Masterson, V. A., Meacham, M., Merrie, A., Ospina, D., Schill, C., & Sinare, H. (2017). The undisciplined journey: Early-career perspectives in sustainability science. *Sustainability Science*, 13(1), 191–204. <https://doi.org/10.1007/s11625-017-0445-1>
- Hammersley, M., & Atkinson, P. (1995). *Ethnography: Principles in practice*, (2nd ed.). Routledge.
- Harrison, C. M., Burgess, J., & Clark, J. (1998). Discounted knowledges: Farmers' and residents' understandings of nature conservation goals and policies. *Journal of Environmental Management*, 54(4), 305–320. <https://doi.org/10.1006/jema.1998.0242>
- Haskell, D. G. (2018). *The songs of trees*. Penguin Random House.
- Hohenthal, J., Minoia, P., & Pelliikka, P. (2017). Mapping meaning: Critical cartographies for participatory water management in Taita Hills, Kenya. *The Professional Geographer*, 69(3), 383–395. <https://doi.org/10.1080/00330124.2016.1237294>
- Horowitz, L. (2015). Local environmental knowledge. In T. Perreault, G. Bridge, & J. McCarthy (Eds.), *The Routledge handbook of political ecology* (pp. 235–248). Routledge.
- Ingold, T. (2006). Rethinking the animate, re-animating thought. *Journal of Anthropology*, 71(1), 9–20.
- Ingold, T. (2013). Dreaming of dragons: On the imagination of real life. *Journal of the Royal Anthropological Institute*, 19(4), 734–752. <https://doi.org/10.1111/1467-9655.12062>
- Ingold, T., & Kurtilla, T. (2000). Perceiving the environment in Finnish Lapland. *Body & Society*, 6(3–4), 183–196. <https://doi.org/10.1177/1357034x00006003010>
- Itani, O. S., Goad, E. A., & Jaramillo, F. (2019). Building customer relationships while achieving sales performance results: Is listening the holy grail of sales? *Journal of Business Research*, 102, 120–130. <https://doi.org/10.1016/j.jbusres.2019.04.048>
- Kareiva, P. M., Watts, S., McDonald, R., & Boucher, T. (2007). Domesticated nature: Shaping landscapes and ecosystems for human welfare. *Science*, 316(5833), 1866–1869.
- Kimmerer, R. W. (2012). Searching for synergy: Integrating traditional and scientific ecological knowledge in environmental science education. *Journal of Environmental Studies and Sciences*, 2(4), 317–323. <https://doi.org/10.1007/s13412-012-0091-y>

- Klain, S. C., Olmsted, P., Chan, K. M. A., & Satterfield, T. (2017). Relational values resonate broadly and differently than intrinsic or instrumental values, or the New Ecological Paradigm. *PLoS One*, 12(8), e0183962. <https://doi.org/10.1371/journal.pone.0183962>
- Klenk, N. (2008). Listening to the birds: A pragmatic proposal for forestry. *Environmental Values*, 17(3), 331–351. <https://doi.org/10.3197/096327108X343112>
- Koch, N. (2020). Deep listening: Practicing intellectual humility in geographic fieldwork. *Geographical Review*, 110(1–2), 52–64. <https://doi.org/10.1111/gere.12334>
- Martinez-Alier, J. (2008). Languages of valuation. *Economic and Political Weekly*, 43, 28–32.
- Massey, D. B. (2005). *For space*. Sage Publications Ltd.
- McGregor, D. (2018). Mino-Mnaamodzawin – Achieving indigenous environmental justice in Canada. *Environment and Society: Advances in Research*, 9(1), 7–24. <https://doi.org/10.3167/ares.2018.090102>
- Millar, J. (2001). *Listening to landholders: Approaches to community nature conservation in Queensland*. Queensland Parks and Wildlife Service.
- Mollett, S. (2018). Environmental struggles are feminist struggles. Feminist political ecology as development critique. In A. M. Oberhauser, J. L. Fluri, R. Whiston, & S. Mollett (Eds.), *Feminist spaces. Gender and geography in global context* (pp.155–188). Routledge.
- Moon, K., Adams, V. M., & Cooke, B. (2019). Shared personal reflections on the need to broaden the scope of conservation social science. *People and Nature*, 1(4), 426–434. <https://doi.org/10.1002/pan3.10043>
- Moon, K., & Blackman, D. (2014). A guide to understanding social science research for natural scientists. *Conservation Biology*, 28, 1167–1177. <https://doi.org/10.1111/cobi.12326>
- Nassauer, J. I. (2011). Care and stewardship: From home to planet. *Landscape and Urban Planning*, 100(4), 321–323. <https://doi.org/10.1016/j.landurbplan.2011.02.022>
- Neuteleers, S. (2020). A fresh look at 'relational' values in nature: Distinctions derived from the debate on meaningfulness in life. *Environmental Values*, 29(4), 461–479. <https://doi.org/10.3197/096327119X15579936382699>
- Nightingale, A. (2011). Beyond design principles: Subjectivity, emotion, and the (ir)rational commons. *Society & Natural Resources*, 24(2), 119–132. <https://doi.org/10.1080/08941920903278160>
- Noss, R. F. (2007). Value are a good thing in conservation biology. *Conservation Biology*, 21(1), 18–20. Retrieved from <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1523-1739.2006.00637.x>
- Nyumba, T. O., Wilson, K., Derrick, C. J., & Mukherjee, N. (2018). The use of focus group discussion methodology: Insights from two decades of application in conservation. *Methods in Ecology and Evolution*, 9, 20–32. <https://doi.org/10.1111/2041-210X.12860>
- O'Faircheallaigh, C. (2010). Public participation and environmental impact assessment: Purposes, implications, and lessons for public policy making. *Environmental Impact Assessment Review*, 30(1), 19–27. <https://doi.org/10.1016/j.eiar.2009.05.001>
- Owens, S. (2016). 'Engaging the Public': Information and deliberation in environmental policy. *Environment and Planning A: Economy and Space*, 32(7), 1141–1148. <https://doi.org/10.1068/a3330>
- Pasgaard, M., Dawson, N., Vang Rasmussen, L., Enghoff, M., & Jensen, A. (2017). The research and practice of integrating conservation and development: Self-reflections by researchers on methodologies, objectives and influence. *Global Ecology and Conservation*, 9, 50–60. <https://doi.org/10.1016/j.gecco.2016.11.006>
- Petheram, L., & Campbell, B. M. (2010). Listening to locals on payments for environmental services. *Journal of Environmental Management*, 91(5), 1139–1149. <https://doi.org/10.1016/j.jenvman.2010.01.002>
- Pickerill, J. (2009). Finding common ground? Spaces of dialogue and the negotiation of Indigenous interests in environmental campaigns in Australia. *Geoforum*, 40, 66–79. <https://doi.org/10.1016/j.geoforum.2008.06.009>
- Primmer, E., Termansen, M., Bredin, Y., Blicharska, M., García-Llorente, M., Berry, P., Jääskeläinen, T., Bela, G., Fabok, V., Geamana, N., Harrison, P. A., Haslett, J. R., Lavinia Cosor, G., & Andersen, A. H. K. (2017). Caught between personal and collective values: Biodiversity conservation in European decision-making. *Environmental Policy and Governance*, 27(6), 588–604.
- Puig de la Bellacasa, M. (2017). *Matters of care*. University of Minnesota Press.
- Ratham, C. (2019). Listening to difficult stories: Listening as a research methodology. *Emotion, Space & Society*, 31, 18–25. <https://doi.org/10.1016/j.emospa.2019.03.003>
- Ravetz, J. (2004). The post-normal science of precaution. *Futures*, 36(3), 347–357. [https://doi.org/10.1016/S0016-3287\(03\)00160-5](https://doi.org/10.1016/S0016-3287(03)00160-5)
- Redpath, S. M., Bhatia, S., & Young, J. (2015). Tilting at wildlife: Reconsidering human wildlife conflict. *Oryx*, 49(02), 222–225. <https://doi.org/10.1017/S0030605314000799>
- Richardson, M., & McKewan, K. (2018). 30 days wild and the relationships between engagement with Nature's Beauty, Nature Connectedness and Well-Being. *Frontiers in Psychology*, 9. <https://doi.org/10.3389/fpsyg.2018.01500>
- Richardson, M., Richardson, E., Hallam, J., & Ferguson, F. J. (2020). Opening doors to nature: Bringing calm and raising aspirations of vulnerable young people through nature-based intervention. *The Humanistic Psychologist*, 48(3), 284–297. <https://doi.org/10.1037/hum0000148>
- Rodriguez, I. (2020). Latin American decolonial environmental justice. In B. Coolsaet (Ed.), *Environmental justice. Key issues* (pp. 78–93). Earthscan, Routledge.
- Ryfe, D. M. (2002). The practice of deliberative democracy: A study of 16 deliberative organizations. *Political Communication*, 19(3), 359–377. <https://doi.org/10.1080/01957470290055547>
- Sandbrook, C., Adams, W. M., Büscher, B., & Vira, B. (2013). Social research and biodiversity conservation. *Conservation Biology*, 27, 1487–1490. <https://doi.org/10.1111/cobi.12141>
- Santos de Sousa, B. (2008). *Another knowledge is possible. Beyond Northern Epistemologies*. Verso.
- Satterfield, T., & Levin, J. (2007). From cold war complex to nature preserve: Diagnosing the breakdown of a multi-stakeholder decision process and its consequences for rocky flats. In B. R. Johnson (Ed.), *Half-lives & half-truths: Confronting the radioactive legacies of the cold war*. School for Advanced Research Press.
- Scazza, M. (no date). *Chanted memories Waorani storytelling of resistance*. Extracting Us. Retrieved from <https://extractingus.org/contributors/margherita-scazza/>
- Scheid, A. F. (2011). Under the palaver tree: Community ethics for truth-telling and reconciliation. *Journal of the Society of Christian Ethics*, 31(1), 17–36. <https://doi.org/10.5840/jsce201131128>
- Sevenhuijsen, S. L. (2018). Care and attention. *South African Journal of Higher Education*, 32(6), 19–30. <https://doi.org/10.20853/32-6-2711>
- Sheremata, M. (2018). Listening to relational values in the era of rapid environmental change in the Inuit Nunangat. *Current Opinion in Environmental Sustainability*, 35, 75–81. <https://doi.org/10.1016/j.cosust.2018.10.017>
- Sketch, M., Dayer, A. A., & Metcalf, A. L. (2020). Engaging landowners in the conservation conversation through landowner-listening workshops. *Society & Natural Resources*, 33(5), 669–680. <https://doi.org/10.1080/08941920.2019.1657996>
- Soulé, M. E. (2013). The 'New Conservation'. *Conservation Biology*, 27(5), 895–897. <https://doi.org/10.1111/cobi.12147>
- Spiegel, S. J., Thomas, S., O'Neill, K., Brondgeest, C., Thomas, J., Beltran, J., Hunt, T., & Yassi, A. (2020). Visual storytelling, intergenerational environmental justice and indigenous sovereignty: Exploring images and stories amid a contested oil pipeline project. *International Journal of Environmental Research and Public Health*, 17(7), 2362. <https://doi.org/10.3390/ijerph17072362>

- Staddon, S. (in press) 'Conservation's all about having a blether and getting people on board': Understanding the role of people, place and past in conservation. *Conservation & Society*.
- Staddon, S. (2014). The Ethics of 'Giving Back' to Communities involved in fieldwork. In J. Lunn (Ed.), *Ethical challenges and dilemmas of fieldwork in the Global South* (pp. 249–261), Routledge.
- Stern, M. J. (2017). Caveating behavior modification approaches to conservation. *Conservation Letters*, 10(2), 267–268. <https://doi.org/10.1111/conl.12271>
- Stern, M. J., & Baird, T. D. (2015). Trust ecology and the resilience of natural resource management institutions. *Ecology and Society*, 20(2), 14. <https://doi.org/10.5751/ES-07248-200214>
- Stern, M. J., & Coleman, K. J. (2015). The multi-dimensionality of trust: Applications in collaborative natural resource management. *Society & Natural Resources*, 28(2), 117–132. <https://doi.org/10.1080/08941920.2014.945062>
- Streit Krug, A. (2020). Ecospheric care work. *The Ecological Citizen*, 3, 143–148.
- Sultana, F. (2011). Suffering for water, suffering from water: Emotional geographies of resource access, control and conflict. *Geoforum*, 42(2), 163–172. <https://doi.org/10.1016/j.geoforum.2010.12.002>
- Sundberg, J. (2004). Identities in the Making: Conservation, gender and race in the Maya Biosphere Reserve. *Guatemala. Gender, Place and Culture*, 11(1), 43–66. <https://doi.org/10.1080/0966369042000188549>
- Tallis, H., & Lubchenco, J. (2014). Working together: A call for inclusive conservation. *Nature*, 515(7525), 27–28. <https://doi.org/10.1038/515027a>
- Teel, T. L., Anderson, C. B., Burgman, M. A., Cinner, J., Clark, D., Estévez, R. A., Jones, J. P., McClanahan, T. R., Reed, M. S., Sandbrook, C., & St John, F. A. (2018). Publishing social science research in Conservation Biology to move beyond biology. *Conservation Biology*, 32(1), 6–8. <https://doi.org/10.1111/cobi.13059>
- Tengö, M., Brondizio, E. S., Elmqvist, T., Malmer, P., & Spierenburg, M. (2014). Connecting diverse knowledge systems for enhanced ecosystem governance: The multiple evidence base approach. *Ambio*, 43(5), 579–591. <https://doi.org/10.1007/s13280-014-0501-3>
- Tengö, M., Hill, R., Malmer, P., Raymond, C. M., Spierenburg, M., Danielsen, F., Elmqvist, T., & Folke, C. (2017). Weaving knowledge systems in IPBES, CBD and beyond—lessons learned for sustainability. *Current Opinion in Environmental Sustainability*, 26–27, 17–25. <https://doi.org/10.1016/j.cosust.2016.12.005>
- Trainor, S. F. (2006). Realms of value: Conflicting natural resource values and incommensurability. *Environmental Values*, 15(1), 3–29. <https://doi.org/10.3197/096327106776678951>
- Tronto, J. C. (1993). *Moral boundaries – A political argument for an ethic of care*. Routledge.
- Tsing, A., Bubandt, N., Gan, E., & Swanson, H. (2017). *Arts of living on a damaged planet: Ghosts and monsters of the Anthropocene*. University of Minnesota Press.
- Tuhiwai-Smith, L. (2012). *Decolonizing methodologies. Research and indigenous peoples*. Zed Books.
- Twyman, C., Morrison, J., & Sporton, D. (1999). The final fifth: Autobiography, reflexivity and interpretation in cross-cultural research. *Area*, 31(4), 313–325. <https://doi.org/10.1111/j.1475-4762.1999.tb00098.x>
- UKRI. (2020). *ESRC – Our core principles*. Retrieved from <https://esrc.ukri.org/funding/guidance-for-applicants/research-ethics/our-core-principles/>
- van Dooren, T. (2014). Care. *Environmental Humanities*, 5(1), 291–294. <https://doi.org/10.1215/22011919-3615541>
- van Dulmen, S. (2017). *Listen: When words don't come easy Patient Educ Couns* 1975–1978. <https://doi.org/10.1016/j.pec.20df17.06.021>
- Van Houtan, K. S. (2006). Conservation as virtue: A scientific and social process for conservation ethics. *Conservation Biology*, 20(5), 1367–1372. <https://doi.org/10.1111/j.1523-1739.2006.00447.x>
- Walsh, C. (2005). *La interculturalidad en la educacion*. Ministerio de Educacion DINEBI.
- West, P. (2006). *Conservation is our government now: The politics of ecology in Papua New Guinea*. Duke University Press.
- West, S., Haider, L. J., Masterson, V., Enqvist, J. P., Svedin, U., & Tengö, M. (2018). Stewardship, care and relational values. *Current Opinion in Environmental Sustainability*, 35, 30–38. <https://doi.org/10.1016/j.cosust.2018.10.008>
- Wheeler, H. C., Danielsen, F., Fidel, M., Hausner, V., Horstkotte, T., Johnson, N., Lee, O., Mukherjee, N., Amos, A., Ashthorn, H., Ballari, Ø., Behe, C., Breton-Honeyman, K., Retter, G.-B., Buschman, V., Jakobsen, P., Johnson, F., Lyberth, B., Parrott, J. A., ... Vronski, N. (2020). The need for transformative changes in the use of Indigenous knowledge along with science for environmental decision-making in the Arctic. *People and Nature*, 2(3), 544–556. <https://doi.org/10.1002/pan3.10131>
- Wolvin, A. D. (2012). Listening in the general education curriculum. *The International Journal of Listening*, 26, 122–128. <https://doi.org/10.1080/10904018.2012.678201>
- Wright, S., Lloyd, K., Suchet-Pearson, S., Burarrwanga, L., Tofa, M., & Country, B. (2012). Telling stories in, through and with Country: Engaging with Indigenous and more-than-human methodologies at Bawaka, NE Australia. *Journal of Cultural Geography*, 29(1), 39–60. <https://www.tandfonline.com/doi/abs/10.1080/08873631.2012.646890>
- Wynne-Jones, S. (2017). Understanding farmer co-operation: Exploring practices of social relatedness and emergent affects. *Journal of Rural Studies*, 53, 259–268. <https://doi.org/10.1016/j.jrurstud.2017.02.012>
- Young, J., Searle, K., Butler, A., Simmons, P., Watt, A. D., & Jordan, A. (2016). The role of trust in conservation conflicts. *Biological Conservation*, 195, 196–202.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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